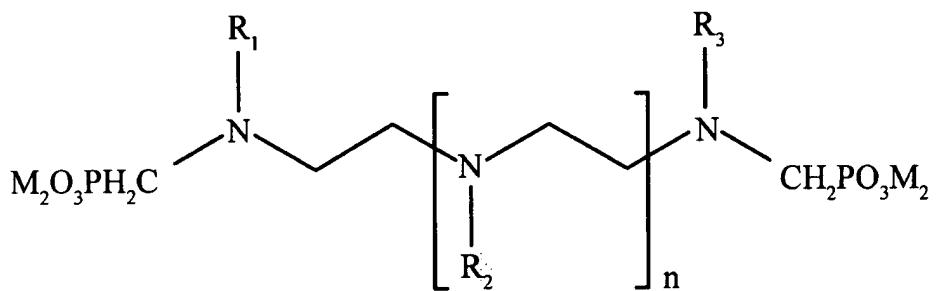


ABSTRACT

[0177]

In one embodiment, a scale inhibitor comprising at least one polymethylenephosphonate derivative having the following formula:



wherein n is a number, wherein M is hydrogen or a cation, wherein R_1 , R_2 , and R_3 are each independently selected from the group consisting of $\text{CH}_2\text{PO}_3\text{M}_2$, CH_2R_4 , wherein R_4 is CHOHCH_3 , CHOHCH_2Cl , or CHOHCH_2OH , $(\text{CH}_2)_m\text{SO}_3\text{M}$, wherein m is 3 or 4, and $\text{CH}_2\text{CH}_2\text{R}_5$, wherein R_5 is CONH_2 , CHO , COOR_6 , COOX , or CN , wherein R_6 is CH_3 or C_2H_5 , and wherein X is an alkali metal or ammonium, and wherein at least one of R_1 , R_2 , and R_3 is not $\text{CH}_2\text{PO}_3\text{M}_2$. In another embodiment, a method for inhibiting scale formation in water, and in still another embodiment, a method for sequestering iron ions in a water systems, each of the methods comprising the step of providing the water with the above described polymethylenephosphonate derivative.